

WHAT IS CLAIMED IS:

1. A monitoring apparatus for detecting a thickness of a layer deposited on an inner wall surface of a processing chamber of a dry processing apparatus, comprising:

a measurement window formed in the inner wall surface of the processing chamber and which can transmit light;

means for irradiating said measurement window with measurement light at an incident angle that said measurement light is totally reflected by an inner surface of said measurement window on the side of the inner wall surface of the processing chamber;

detection means for focusing said measurement light reflected by the inner surface of said measurement window and a surface of the layer deposited on the inner surface of said measurement window to detect said measurement light; and

means for evaluating the layer deposited on the inner surface of said measurement window on the basis of a detection result of said detection means.

2. A monitoring apparatus according to Claim 1, wherein a reflection portion which reflects said measurement light and a transmission portion which transmits said measurement light are formed on the inner surface of said measurement window on the side of the inner wall surface of the processing chamber, and said evaluation means evaluates the deposited layer on

20250701:051001

the inner surface on the basis of said measurement light reflected by said reflection portion formed on the inner surface and said measurement light which said transmission portion transmits and is reflected by the surface of the layer deposited on the inner surface.

3. An monitoring apparatus according to Claim 1, wherein a reflection and transmission layer which reflects part of said measurement light and which transmits the remaining part of said measurement light is formed on the inner surface of said measurement window on the side of the inner wall surface of the processing chamber, and said evaluation means evaluates the deposited layer on the inner surface on the basis of said measurement light reflected by said reflection and transmission layer formed on the inner surface and said measurement light which said reflection and transmission layer transmits and is reflected by the surface of the layer deposited on the inner surface.

4. A dry processing method of generating discharge in a processing chamber in a predetermined gas atmosphere to process an object to be processed so that a deposit produced in the processing chamber is cleaned, comprising:

irradiating a measurement window, which is formed in an inner wall surface of the processing chamber and can transmit light, with measurement light at an incident angle that said measurement light is totally reflected by an inner surface of said

measurement window;

focussing said measurement light reflected by the inner surface of said measurement window and a surface of a layer deposited on the inner surface to detect said measurement light;

evaluating the layer deposited on the inner surface of said measurement window on the basis of the detected reflected light of said measurement light; and

deciding a time of cleaning the deposit produced in the processing chamber on the basis of the evaluation of the deposited layer.

5. A dry processing apparatus for generating discharge in a processing chamber in a predetermined gas atmosphere to process an object to be processed so that a deposit produced in the processing chamber is cleaned, comprising:

a measurement window which is formed in an inner wall surface of the processing chamber and can transmit light;

means for irradiating said measurement window with measurement light at an incident angle that said measurement light is totally reflected by an inner surface of said measurement window on the side of an inner wall surface of the processing chamber;

detection means for focusing said measurement light reflected by the inner surface of said measurement window and a surface of a layer deposited on the inner surface to detect said measurement light;

and

means for evaluating the layer deposited on the inner surface of said measurement window on the basis of the detection result of said detection means and deciding a time of cleaning the deposit produced in the processing chamber on the basis of the evaluation of the deposited layer.

6. A dry processing apparatus according to Claim 5, wherein a reflection portion which reflects said measurement light and a transmission portion which transmits said measurement light are formed on the inner surface of said measurement window formed in the inner wall surface of the processing chamber, and said evaluation means calculates a thickness of the deposited layer on the inner surface on the basis of a deviation between an optical axis of said measurement light reflected by said reflection portion and an optical axis of said measurement light which said transmission portion transmits and which is reflected by the surface of the layer deposited on the inner surface and judges a state of irregularities of the surface of the deposited layer on the basis of the calculated thickness and a quantity of said measurement light reflected by said reflection portion.